UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,652	08/28/2003	Hahn Vo	200300017-1	7276

22879 7590 01/22/2008

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
YU, HENRY W	
ART UNIT	**PAPER NUMBER**
2182	

NOTIFICATION DATE	DELIVERY MODE
01/22/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
mkraft@hp.com
ipa.mail@hp.com

Office Action Summary	Application No.	Applicant(s)	
	10/650,652	VO, HAHN	
	Examiner	Art Unit	
	Henry Yu	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/08/2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

INFORMATION CONCERNING RESPONSES

Response to Amendment

1. This Office Action is in response to applicant's communication filed November 8, 2007, in response to PTO Office Action mailed October 3, 2007. The Applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.

2. In response to the last Office Action, **claims 9, 11, and 23-24** has been amended. As a result, **claims 1-28** are now pending in this application.

3. The objections to the specifications and drawings have been withdrawn due to the amendment filed November 8, 2007.

Response to Arguments

Applicant's arguments filed on November 8, 2007, in response to the office action mailed October 3, 2007, have been fully considered and are not persuasive.

Applicant argues that Niizuma et al. (Patent Number US 6,338,105 B1) does not disclose that a "*plurality of independent communication links to a plurality of devices*," particularly with regards to independent communication links. However, it should be noted that Niizuma et al. also shows a configuration where there are a plurality of independent links to a plurality of peripheral devices (or "*device functions*" as disclosed by Niizuma et al.), particularly in FIG. 4 and FIG. 5. Though there are U-Device functions (FIG. 4, with the U-Device functions being represented by device functions

#01, #11, #21, and #31 in FIG. 5) between the host ports and the L-Device functions, there are an equal number of U-Device functions and ports on the host system. Hence, the U-Device functions can be seen as being the same as the ports on the host system, with the L-Device functions (device functions #02, #03, #12, #32, #33, and #34 in FIG. 5) being analogous to a "*plurality of devices*."

Applicant also argues that Niizuma et al. does not disclose a switch that "*dynamically varies the number of communication links associated with a port*." However, Niizuma et al. notes that the host transmits a Device Request to confirm whether any device functions are connected to the ports *after completing initialization* **[Column 18, lines 8-10]**, which indicates that the ability to ascertain device connections (and hence establish communication links) can occur at any time (and hence is dynamic in nature) and is not tied to the time of system initialization.

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-9, 14-21, and 27-28** are rejected under 35 U.S.C. 102(b) as being anticipated by Niizuma et al. (Patent Number US 6,338,105 B1).

As per **claim 1**, Niizuma et al. discloses "*an electronic device, comprising: control logic* ***(port controller and frame controller; FIG. 21)***" and "*a plurality of ports* ***(FIG. 5, 6, and 21)*** *configurable by said control logic as determined by a programmable register* ***(instruction register whose contents are used by the port controller and frame controller; Column 24, lines 23-27 and 35-36)****, wherein each of said ports is configurable to operate as a single communication link to a single device or as a plurality of independent communication links to a plurality of devices* ***(each port is configured to handle varying numbers of device functions. The example in FIG. 6 show ports handling anywhere from one to four device functions. See also FIGs. 4 and 5)***."

As per **claim 2**, Niizuma et al. discloses "*said programmable register can be written to specify a configuration for each port* ***(contents of the instruction register is used by the port controller for controlling ports involved in data transmission and reception (Column 24, lines 23-27 and 35-36). There also exists an internal register that stores AP bit composition which includes bits specifying port settings; Column 38, lines 65-67; Column 39, lines 1-3)***."

As per **claim 3**, Niizuma et al. discloses "*each port may have a configuration that differs from at least one other port* ***(each port is configured to handle varying numbers of device functions; FIG. 6)***."

As per **claim 4**, Niizuma et al. discloses "*each port is configurable to one of a plurality of configurations by a plurality of bits associated with that port* ***(an AP bit composition is held in an internal register. The AP bit composition consists of***

port setting bits (for each port) and other configuration bits relating to devices connected to a particular port; Column 38, lines 65-67; Column 39, lines 1-33)."

As per **claim 5**, Niizuma et al. discloses "*said plurality of configurations includes a single communication link configuration and a multi-communication link configuration* ***(the AP bit compositions includes bits relating to connected devices to a port (LM), which specifies whether there is only a base device connected or more than one device connected to a particular port; Column 39, lines 44-53)***."

As per **claim 6**, Niizuma et al. discloses "*said multi-communication link configuration includes a two communication link configuration and a four communication link configuration* ***(the host ports can be configured to handle two device functions (e.g. for port B) or four device functions (e.g. for port D); FIG. 6)***."

As per **claim 7**, Niizuma et al. discloses "*said multi-communication link configuration further includes a three communication link configuration* ***(the host ports can be configured to handle three device functions (e.g. for port A); FIG. 6)***."

As per **claim 8**, Niizuma et al. discloses "*each port is configurable to operate as a single communication link, a pair of independent communication links or four independent communication links* ***(the host ports can be configured to handle two device functions (e.g. for port B), three device functions (e.g. for port A), or four device functions (e.g. for port D); FIG. 6)***."

As per **claim 9**, Niizuma et al. discloses "*said device comprises a network switch that is adapted to receive port configuration information from a computer coupled to said network switch* ***(contents of the instruction register is used by the port controller***

for controlling ports (Column 24, lines 23-27 and 35-36), with the instructions being sent from an application through the main bus; FIG. 21; Column 24, lines 23-27)."

As per **claim 14**, Niizuma et al. discloses "*a switch, comprising: control logic* ***(port controller and frame controller; FIG. 21)***" and "*a plurality of ports coupled to said control logic* ***(FIG. 5, 6, and 21)***." Niizuma et al. also discloses "*means for selectively configuring each of said ports to operate as a single communication link to a single device or as a plurality of communication links each to a separate device* ***(each port is configured to handle varying numbers of device functions. The example in FIG. 6 show ports handling anywhere from one to four device functions)***."

As per **claim 15**, Niizuma et al. discloses "*said means includes means for selectively configuring each port to operate as two or four communication links* ***(the host ports can be configured to handle two device functions (e.g. for port B) or four device functions (e.g. for port D); FIG. 6)***."

As per **claim 16**, Niizuma et al. discloses "*said means includes means for configuring each port differently than at least one other port* ***(each port is configured to handle varying numbers of device functions; FIG. 6)***."

As per **claim 17**, Niizuma et al. discloses "*a switch* ***(host)****, comprising: a plurality of ports adapted to couple to a plurality of network devices* ***(a plurality of device functions)****, each port providing at least one communication link* ***(each port can be connected to at least one device function; FIG. 6)***." Niizuma et al. discloses "*control logic operable to configure the switch to dynamically vary the number of communication*

links associated with at least one port ***(instruction register whose contents are used by the port controller and frame controller (Column 24, lines 23-27 and 35-36), where depending on the devices being connected to a particular port influences the configuration of the AP bit compositions associated with each port (Column 38, lines 65-67; Column 39, lines 1-3). Also, the host transmits a Device Request to confirm whether any device functions are connected to the ports after completing initialization (Column 18, lines 8-10), which indicates that the ability to ascertain device connections (and hence establish communication links) can occur at any time (and hence is dynamic in nature) and is not tied to system initialization)****."

As per **claim 18**, Niizuma et al. discloses "*three or more links are configured with the at least one port* ***(the host ports can be configured to handle three device functions (e.g. for port A) or more; FIG. 6)***."

As per **claim 19**, Niizuma et al. discloses "*a port comprises a single communication link and the at least one port comprises at least two independently operable communication links* ***(the host ports can be configured to handle one device function (e.g. for port C) or two device functions (e.g. for port B); FIGs. 4, 5, and 6)***."

As per **claim 20**, Niizuma et al. discloses "*the at least one port comprises at least three independently operable communication links* ***(the host ports can be configured to handle three device functions (e.g. for port A); FIGs. 4, 5, and 6)***."

As per **claim 21**, Niizuma et al. discloses "*each port is programmable to have a different number of communication links than at least one other port* ***(each port is configured to handle varying numbers of device functions; FIG. 6)***."

As per **claim 27**, Niizuma et al. discloses "*a method, comprising: determining the number of devices coupled to a switch port* ***(the host must discover whether a base device or expansion device is connected to any of the ports; Column 40, lines 43-46)***; *and programming said switch port to provide two or more independent communication links if said number is greater than one* ***(an AP bit composition consists of port setting bits (for each port) and other configuration bits relating to devices connected to a particular port; Column 38, lines 65-67; Column 39, lines 1-33)***."

As per **claim 28**, Niizuma et al. discloses "*the switch port includes conductors* ***(conductors SDCKA and SDCKB as they relate to each port; FIG. 63)*** *and wherein programming the switch port includes causing said two or more independent communication links to be formed using at least some of the conductors that are used if only a single device couples to said switch port* ***(in the situation where a base device and several expansion devices are connected at a single port, there exist identification numbers associated with the connected point that allows for each device to be accessed directly; Column 34, lines 37-41)***."

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 10-13 and 22-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Niizuma et al. (Patent Number US 6,338,105 B1) in view of McConnell et al. (Publication Number US 2003/0120852 A1).

As per **claim 10**, Niizuma et al. discloses "*a multi-port switch, comprising: a processor* ***(port controller and frame controller, which is connected to a plurality of ports; FIG. 21)***" and "*a plurality of ports configurable by said processor* ***(instruction register whose contents are used by the port controller and frame controller (Column 24, lines 23-27 and 35-36), with the instructions being sent from an application through the main bus; FIG. 21; Column 24, lines 23-27)*** *and wherein each of said ports is configurable to operate as either a single communication link to a single device or as a plurality of sub-ports to a plurality of separate devices* ***(each port is configured to handle varying numbers of device functions. The example in FIG. 6 show ports handling anywhere from one to four device functions. See also FIGs. 4 and 5)***." However, Niizuma et al. does not explicitly disclose "*each port adapted to couple to a device to form at least part of a network.*"

McConnell et al. discloses "*each port adapted to couple to a device to form at least part of a network* ***(each channel allows for commands and data messages to***

flow between two connected nodes within the data network; Page 2, paragraph 0024)."

Niizuma et al. and McConnell et al. are analogous art in that they are address the area of device connection and port/channel configuration.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the multi-port switch as disclosed by Niizuma et al. into a network environment as disclosed by McConnell et al.

Niizuma et al. shows that the amount of functionality can increase if a port can be associated with more than one function per port **(Column 12, lines 63-67; Column 13, lines 1-2 and 12-24)**, which is especially helpful in systems with a limited number of physical ports. McConnell et al. expands on this idea by disclosing "*one or more channel adaptors may be advantageously installed at a host system to expand the number of ports available for redundancy* ***(Page 5, paragraph 0049)***" and enable more connectivity **(Page 5, paragraph 0066)**.

As per **claim 11**, the combination of Niizuma et al. and McConnell et al. discloses "*the switch*" (*see rejection to* ***claim 10*** *above*). Niizuma et al. further discloses "*said switch receives configuration information specifying how each port is to be configured, said configuration information received from said single device or from any of said plurality of separate devices* ***(using Device Status, a device function can allow the host to determine the connection relationship and device attributes, and allocates and AP to the device function (Column 18, lines 24-27). The AP bit composition***

includes bits specifying port settings; Column 38, lines 65-67; Column 39, lines 1-3)."

As per **claim 12**, the combination of Niizuma et al. and McConnell et al. discloses "*the switch*" (*see rejection to* ***claim 10*** *above*). McConnell et al. further discloses "*the ports can be configured dynamically while the switch is operating to route packets between devices coupled to said switch* ***(requests for work may be posted to queue pairs associated with a given channel. Also, one or more channels may be created and effectively managed so that requested operations can be performed (emphasis on second point as it shows that the switch can be configured as data is being posted; Page 5, paragraph 0049)***."

As per **claim 13**, the combination of Niizuma et al. and McConnell et al. discloses "*the switch*" (*see rejection to* ***claim 10*** *above*). Niizuma et al. further discloses "*each port is configurable to operate as at least three sub-ports* ***(the host ports can be configured to handle three device functions (e.g. for port A); FIG. 6)***."

As per **claim 22**, Niizuma et al. discloses "*the switch*" (*see rejection to* ***claim 17*** *above*). However, Niizuma et al. does not explicitly disclose "*each port is programmable to have a communication link having a width that is different from a width that is programmable in at least one other communication link.*"

McConnell et al. discloses "*each port is programmable to have a communication link having a width that is different from a width that is programmable in at least one other communication link* ***(there exist multiple port width configuration; Page 7, paragraph 0068)***."

Niizuma et al. and McConnell et al. are analogous art in that they are address the area of device connection and port/channel configuration.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the multi-port switch as disclosed by Niizuma et al. to include a means of providing for varying bandwidths per channel as disclosed by McConnell et al.

McConnell et al. expands on this idea by disclosing "*one or more channel adaptors may be advantageously installed at a host system to expand the number of ports available for redundancy* ***(Page 5, paragraph 0049)***" and enable more connectivity **(Page 5, paragraph 0066)**. Also, the ability to vary the system's configuration allows a user to have greater flexibility with regard to the system's operations for various circumstances.

As per **claim 23**, Niizuma et al. discloses "*each port can be programmed to provide a plurality of independently operable links to at least some of said network devices, each port also being programmable to provide a single communication link to only a single network device* ***(each port is configured to handle varying numbers of device functions. The example in FIG. 6 show ports handling anywhere from one to four device functions)***." Though Niizuma et al. discloses a plurality of ports **(FIG. 6)**, Niizuma et al. does not explicitly disclose "*a network*" or "*a plurality of network devices coupled to said switch and in communication with each other via said multi-port switch.*"

McConnell et al. discloses "*a network, comprising: a multi-port switch* ***(FIG. 1 and 2)***" and "*a plurality of network devices coupled to said switch and in communication with each other via said multi-port switch* ***(channels exist which allow commands and***

data messages to flow between two connected nodes within the data network; Page 2, paragraph 0024)."

Niizuma et al. and McConnell et al. are analogous art in that they are address the area of device connection and port/channel configuration.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the multi-port switch as disclosed by Niizuma et al. into a network environment as disclosed by McConnell et al.

Niizuma et al. shows that the amount of functionality can increase if a port can be associated with more than one function per port **(Column 12, lines 63-67; Column 13, lines 1-2 and 12-24)**, which is especially helpful in systems with a limited number of physical ports. McConnell et al. expands on this idea by disclosing "*one or more channel adaptors may be advantageously installed at a host system to expand the number of ports available for redundancy* ***(Page 5, paragraph 0049)***" and enable more connectivity **(Page 5, paragraph 0066)**.

As per **claim 24**, the combination of Niizuma et al. and McConnell et al. discloses "*the network*" (*see rejection to* ***claim 23*** *above*). Niizuma et al. further discloses "*one of said network devices provides programming information to said multi-port switch to program said ports* ***(using Device Status, a device function can allow the host to determine the connection relationship and device attributes, and allocates and AP to the device function (Column 18, lines 24-27). The AP bit composition includes bits specifying port settings; Column 38, lines 65-67; Column 39, lines 1-3)***."

As per **claim 25**, the combination of Niizuma et al. and McConnell et al. discloses "*the network*" (*see rejection to* ***claim 24*** *above*). Niizuma et al. further discloses "*each port can be programmed to provide one, two, three or four independent communication links* ***(the host ports can be configured to handle one device function (e.g. port C), two device functions (e.g. for port B), three device functions (e.g. for port A), or four device functions (e.g. for port D); FIG. 6)***."

As per **claim 26**, the combination of Niizuma et al. and McConnell et al. discloses "*the network*" (*see rejection to* ***claim 24*** *above*). Niizuma et al. further discloses "*the port includes a plurality of conductors* ***(conductors SDCKA and SDCKB as they relate to each port; FIG. 63)*** *and wherein said two, three and four communication links are formed using at least some of the same conductors that are used when the port provides only a single communication link* ***(in the situation where a base device and several expansion devices are connected at a single port, there exist identification numbers associated with the connected point that allows for each device to be accessed directly; Column 34, lines 37-41)***."

CLOSING COMMENTS

Conclusions

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Yu whose telephone number is (571) 272-9779. The examiner can normally be reached on Monday to Friday, 8:00 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Tsai can be reached on (571) 272-4176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 7, 2008

HY

HENRY TSAI
SUPERVISORY PATENT EXAMINER

1/15/07